Secure Health and Position Tracking System for Soliders using IoT

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ABSTRACT

The paper reports an Internet of Things (IoT) based health monitoring and tracking system for soldiers. The proposed system can be connected on the soldier's body to track their health status and current location using IOT. This information will be transmitted to the control room through IoT. The proposed system comprises of tiny wearable physiological equipment's, sensors, transmission modules. Hence, with the use of the proposed equipment, it is possible to implement a low cost mechanism to protect the valuable human life on the battlefield. The paper reports an Internet of Thing (IoT) based health monitoring and tracking system for soldiers. This information will be transmitted to the control room through IoT. The proposed system comprises of tiny wearable physiological equipment's, sensors, transmission modules.

Key words: Tempture Sensors, Global positioning System, Monitoring, Temperature measurement, Biomedical monitoring.

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INTRODUCTION

Indian armed forces are the third largest standing army in the worth with 1,200,255 active troops and 990,960 reserve troops. The army suffers a lot due to the unavailability of injuries to its personal which may increase the death /Permanent disability toll obrserved that the causalities are caused due to injuries rather than the direct assaults in the battlefield . These Number can be Minimize three experts formally dressed administrations: the military, the naval force, and the flying corps. Fighters being the foundation of any outfitted power generally lose their lives because of absence of clinical assistance when in crisis, like when in crisis, likewise troopers who are associated with missions or in exceptional activities get strayed on war fields and lose contact with the specialists. In this paper, we propose soldiers health tracking using Internet of things (IOT) In the last decades, technologies such walkie-talkie, zig Bee and GSM based tracking system were most dominantly used methodologies for the tracking of soldiers life on

the battlefield. The infantry officer of tomorrow vows to be one of the most innovatively progressed present day fighting has at any point seen. All over the planet, different exploration programs are presently being led, like the United States' wise troopers who are associated with missions or in exceptional activities get strayed on war fields and lose contact with the specialists.

Soldier can be rescued, when in different situations in the following conditions:

1. In unstable physiological regulatory systems – for instance, in the case of overdose of poisonous gas
2. In a life threatening condition – for instance, heart attack in a soldier.
3. In a situation leading to the developing of a risky life threatening condition.
4 In a critical physiological state. ii. 5 To track the exact location of the soldier.

PROBLEM STATEMENT

Indian armed forces are the third largest standing army in the worth with 1,200,255 active troops and 990,960 reserve troops. The army suffers a lot due to the unavailability of injuries to its personal which may increase the death /Permanent disability toll obrserved that the causalities are caused due to injuries rather than the direct assaults in the battlefield. These Number can be Minimize three experts formally dressed administrations: the military, the naval force, and the flying corps. Fighters being the foundation of any outfitted power generally lose their lives because of absence of clinical assistance

PROJECT OBJECTIVE

The objective of the systemis to provide the real-time continuous monitoring of soldier's health parameters and location tracking using IOT and GSM and GPS module. In emergency situation it helps the solider by providing a panic button which sends and emergency message as well as he voice alert using which he can communicate with command officer and other soldiers. Depending on the message the control room takes the necessary action to save the life of the soldier.

LITERATURE SURVEY

Detect position using GPS

Akshay Gondalic, *et al*., designed IoT Based Healthcare Monitoring System for War Soldiers using Machine Learning in 2018. This system enables to army base station to track the position and observe the medical status of soldiers using GPS, temperature sensor, heart beat sensor etc. The information from sensors and GPS values will be transmitted wirelessly using ZigBee system with the other soldiers. In addition, LoRaWAN network system has been suggested to be used between the leader and base station war zones where cellular network coverage is either absent or does not allow data transmission The collected information will be uploaded on the cloud for next step data analysis and predictions using K means clustering algorithm.

Health monitoring System

William Walker A L, *et al*., proposed a mobile health monitoring in 2018. The authors had discussed on different wearable, portably low weight and small size biosensors that have been developed for monitoring of the soldier health status. The system consists of sensors such as heart beat, temperature and gas sensors which can be put on a soldier body for health condition monitoring in real time. In this paper suggest a methodology to develop a system for real time health monitoring of soldiers, consisting of interconnected BSNs. Akshay Gondalic, et al., [4] designed IoT Base.

Control room Knowing, Distance, Position, Health

Mr. Abhilash, Ms. Sathya Shree K P, Ms. Subiya Seher, Ms. Thanusha S. This paper has an idea of if the real time information is available   at the control room about the health and Position of the soldier. These days all countries keep its security at high need. Wars are being battled for land, water and procuring the position of most remarkable country. A nation's arm powers comprise of tracking the soldier's location in real time and navigation between soldier to soldier such as knowing their speed, distance, height as well as health status of them during the war, which enables the army personnel to plan the war strategies. The base station gets the location of a soldier from GPS. It is necessary for the base station to guide the soldier on the correct path if he is lost on the battlefield. The control unit can take immediate action for the soldiers who are in trouble and send a message to the fellow soldier in order to rescue them. And hence can take immediate action by sending help for the soldier or sending backup for threat ahead. Using various biomedical sensor health parameters of soldier's are observed, the position and orientation of the soldier is trapped using the GPS module system.

Soldier tracking status using wifi:

Position Tracking and Health Monitoring System: Priyanka R. Pawar, Abhijeet B. Desai (March 2018) their project efficiently keeps a check on the health status of the soldier, and his precise location to equip him with necessarymedical treatments as soon as possible. Soldier's tracking is done by using GPS and Wi-Fi module, which is used to provide wireless communication system. For monitoring the health parameters of soldier they used bio medical sensors such as temperature sensor and heart beat sensor. An oxygen level sensor is used to monitor atmospheric oxygen so if any climatic changes, the soldiers will be equipped accordingly.

Base station Communication

IOT Based Soldier Navigation and Health Monitoring System: Krutika Patil, Omkar Kumbhar, Sakshi Basangar, Priyanka Bagul (2017). They proposed an efficient system which has an application of tracking the soldier's location and health parameters during the war, which also invokes the military or army officers to plan the war strategies. Base station gets location of soldier from GPS and communication takes place through the wireless modules. An important service of the base station is to guide the soldier on correct path if he is lost in the battlefield. The base station can access the current status of the soldier which is displayed on the PC and this system uses the IOT.

PROPOSED SYSTEM

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper; use the scroll down window on the left of the MS Word Formatting toolbar. Individual to design the conflict strategies. Base station gets area of warrior from GPS. The base station can get to the current status of the warrior which is shown on the telephone with the assistance of GSM also thus suitable activities can be found. The soldier can also request for medical center details near them using this application. The proposed system is not only used to monitor and track the soldier only during the war time but also when the soldier is travelling from one place to other places and even in the places where extreme weather condition.
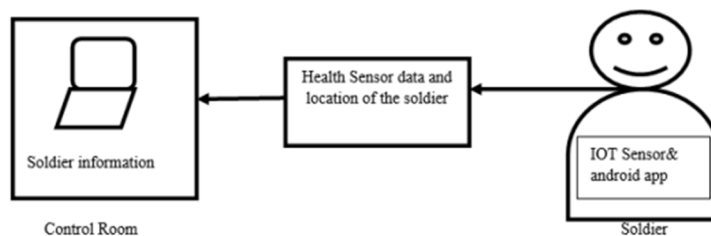

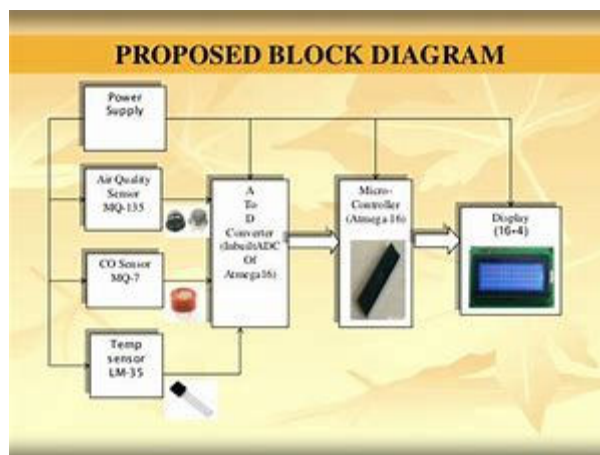
Fig. 1 Proposed System

Fig. 2 Block diagram of proposed System

OVERVIEW

The Soilder System consists of sensors such as heart beat, temperature and gas sensors which can be put on a soldier body for health condition monitoring in real time. In this paper suggest a methodology to develop a system for real time health monitoring of soldiers, consisting of interconnected BSNs.
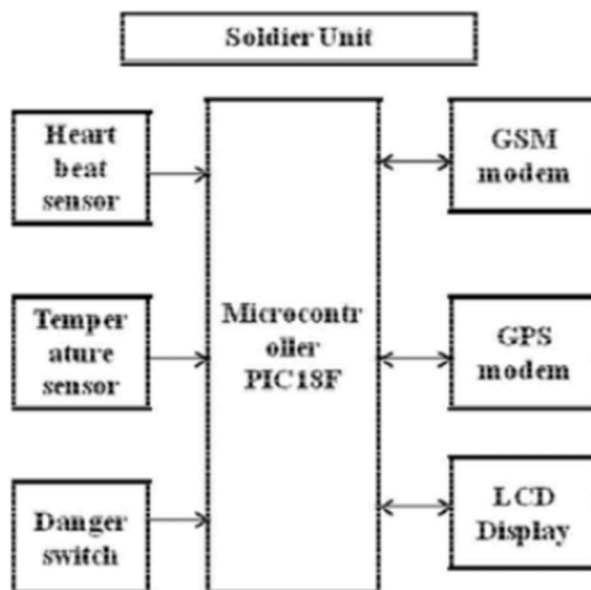
Fig. 3 Overview of soilder unit

SYSTEM STRUCTURE

The block diagram representation of the system components is as shown in figure 4. The paper focuses on the health monitoring system of the soldiers. The block diagram of soldier's position tracking and health monitoring system using IoT includes heart beat, temperature and gas sensors, power supply and GPS as input Arduino UNO as processing device Node MCU for updating information to cloud. Buzzer, LCD display, heater/cooler as output devices. This system increases safety in emergency response of military operation. Heartbeat sensor gives the heart rate by the sensor that measure the rate of flow of blood at the finger tip, by the amount of blood changes with time. Temperature sensor is the sensor that measures the amount of heat that it observes and gives the temperature in Degree Celsius. Gas sensor detects the concentration of gas in the atmosphere that detects the poisonous gas. GPS is used to find the exact location of the Soldier. The direction of the soldier can be find with the use of GPS modem. GPS modem receives the signal from the satellite and calculates the longitude and latitude of the direction of soldiers and send to the controller from serial data Arduino UNO is an Open source microcontroller board based on the microchip AT mega 328P microcontroller and developed by Arduino. Arduino UNO checks the status of heart rate, temperature and gas. If the heart rate is greater than or lesser than its threshold value, Arduino turns ON the buzzer, if the temperature differs from threshold value, it will turn ON the heater/cooler. The position information, heart rate, temperature and gas detection is sent to the Node MCU through serial communication. When Wi-Fi is available, it receives and read the serial data from Arduino and uploads data in IoT and compares the data, if there is any difference in threshold values, it will send SMS/E-mail to the army base station.
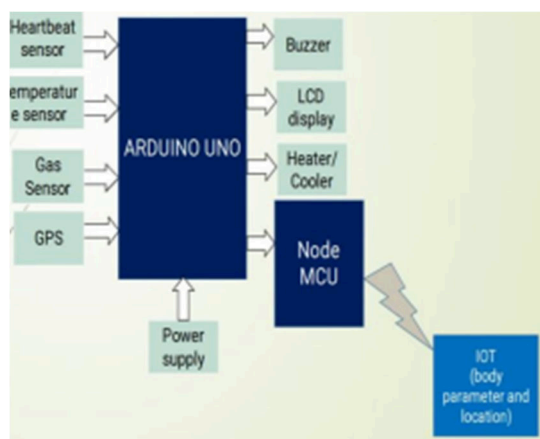

Fig. 4 Block diagram of System architecture

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HARDWARE REQUIREMENT

Pulse Sensor: The sensor used in this project is pulse sensor-SEN-11574. Heart rate data can be really useful for determining the health status of a person. The pulse sensor amped is a plug and play heart rate sensor for arduino. It essentially combines a simple optical heart rate sensor with amplification and noise cancellation circuitry making it fast and easy to get reliable pulse readings. It sips power with just 4 mA current draw at 5V. To use it simply clip the pulse sensor to earlobe or fingertip.

Temperature Sensor: Temperature sensor (LM35) is used for monitoring the temperature of the soldier and his surrounding environment, and the pulse sensor (RC-A-4015) monitors the pulse rate of the soldiers as beats per minute (BPM). If there is any variance among the sensed values and the defined threshold values, then it is considered as an exigency.

Arduino Board: Microcontrollers are one of the significant parts in any inserted framework. A microcontroller is a little PC on a solitary incorporated circuit containing a processor center, memory and programmable info/yield peripherals. Microcontrollers work as indicated by the program composed inside its program memory. The significant utilization of these single chip PCs are in programmed reacting gadgets. The capacity of this part is to gather the data about heart beat of the officer, air temperature and area of the officer in every moment. Then, at that point, it sends this data to the base unit.

GPS Modem: The Global Positioning System (GPS) is a space-*based* global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellites.

GPS Receiver Module: The GP-20U7 is a compact GPS receiver with a built-in high performances all-in-one GPS chipset. The GP-20U7 accurately provides position, velocity, and time readings as well possessing high sensitivity and tracking capabilities. Thanks to the low power consumption this receiving GP20U7 is deal for portable applications such as tablet PCs, smart phones, and other devices requiring positioning cap.

Gas Sensors: A gas sensor **is** a device which detects the presence or concentration of gases in the atmosphere.Based on the concentration of the gas the sensor produces a corresponding potential difference by changing the resistance of the material inside the sensor, which can be measured as output voltage. Based on this voltage value the type and concentration of the gas can be estimated.
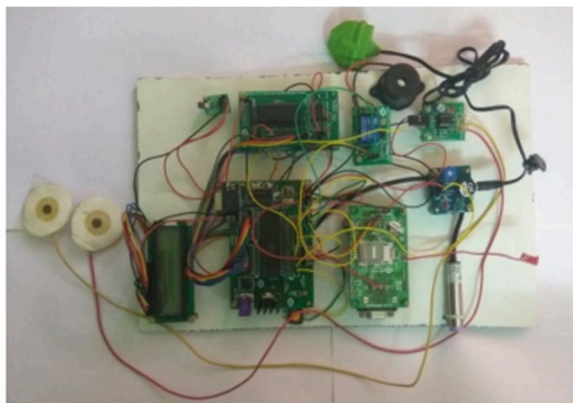

Fig. 5 Hardware of System

RESULT

Parameters	Sensed values
Heart Beat/minute	69bpm
Temperature	20C
Gas	300

Fig. 6 Output of the system

CONCLUSION

We hereby after surveying conclude that the above mentioned technologies would be used in our project description, when the soldier is in the battlefield he or they must wear the device which in turn record all the health parameters of the soldier such the sensors attached to the devise will sense all the health parameters such as heartbeat, temperature and so on and will update it to the squadron**.**

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